Instruction Manual

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Vision Screening with the DVS-V Model 1157

KEYSTONE VIEW

DIVISION OF MAST/KEYSTONE

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Keystone View

Excellence in Vision Testing

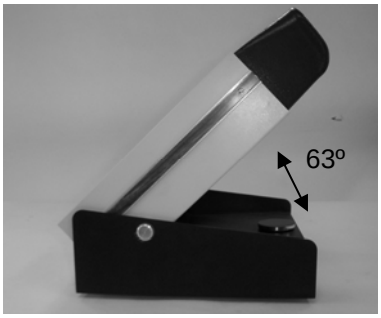
The DVS-V Test Instrument

The Keystone DVS-V Vision Screener represents the *fifth generation* of electro/mechanical vision test instruments. All functions are under push button control… for unparalleled ease and reliability of operation. Completely self contained, the unit operates from standard 110-120 volt AC power. It's light in weight, unusually compact, and can go wherever it's needed.

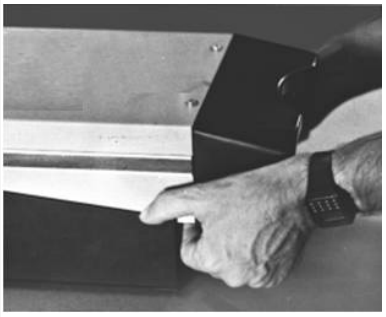
Basic Instrument Features

Headrest
The test subject's forehead should rest lightly against this specially designed strip.

Lighting System
Tests are illuminated by two long-life Daylight LED lamps that virtually assure that the lamps will never fail or need to be changed during the life of the machine.



The DVS-V adjusts effortlessly to the eye level of any test subject. It pivots through a 63 degree arc with free-floating action fully controlled by the subject. (When not in use, a magnetic catch holds the unit closed.)



Important Notice: *The instrument is held closed by a magnetic latch. To free the latch, place thumbs on the top edge of the base and press up on the bottom of chassis (see illustration).*

DO NOT lift up by the black eye shield assembly.

Far Point System
Far test distances are created using single-segment, hard resin lenses. Test targets appear at the precise equivalent of twenty feet.

Optical Sensor
This exclusive accessory device assures that a test subject's head is properly positioned in the instrument. If it is not, the target illumination lamps will not light and no test can be conducted. This also increases energy efficiency and extends lamp life. If desired, the sensor can be overridden using the Elliptech Hand Control.

Power Switch
The off-on power control is located on the rear of the instrument case.

Elliptech Control Unit
Puts test operations under push button command.

Transformer
To eliminate electrical and heat hazards, power for the DVS-V is converted to 12 volts dc. A UL-listed wall transformer is supplied as an integral part of the power cord.

Light and Compact
Only 10" wide, 15-1/2" long and 6-1/2" high, the DVS-V is a space saver that requires little more than a square foot of desk area. Total unit weight is less than 11 pounds.

Peripheral Vision Test
Light emitting diode target lamps between the lenses and recessed in the temple areas of the viewing head, measure horizontal peripheral visual fields. They are positioned so eyeglass frames will not interfere with testing.

Storage Area
A convenient storage area, accessible from the rear, is built into the base of the instrument. The control unit, transformer, and record forms may be stored there when the DVS-V is not in use.

DVS-V Maintenance

Under normal conditions of use, the DVS-V will require little maintenance if it is protected by a dust cover when not in use. Virtually no repair or adjustment will be needed, since all operating component are protected and solid-state circuitry assures exceptionally high reliability.

Cleaning

Periodically, some cleaning will be necessary. The main instrument housing and control unit should be dusted from time to time with a soft cloth or brush … and the lenses washed with soap and water and dried with a soft cloth or tissue.

If the instrument has become very soiled, it may be washed with a mild soap and water solution or wiped with a general purpose spray cleaner. (Other solvents are not recommended.) ***Be sure to disconnect the unit from its power supply before washing.***

When the DVS-V is used in a heavy industrial environment, such as that of a foundry, it is possible that some dust may accumulate on the stereo targets. In this case, remove the top cover of the instrument and carefully dust the targets with a soft camel's hair brush. ***The drum should not be removed.*** Instead, rotate it using the test advance / reverse buttons on the control panel.

If carrying the instrument long distances, Keystone View recommends transporting it in its specially-designed carrying case. (product #1140)

Lamp Replacement

Two Nichia NSPW515BS Long-Life Daylight LED's lamps provide illumination of the stereo targets. Although they are rated for a long duration of continuous use, replacement may eventually be required. Two extra lamps are included with the DVS-V, they are taped on the inside wall of the machine. Simply unscrew and remove the top panel in order to access the lamps.

Fuse Replacement

A standard 3/4 ampere automotive-type fuse is incorporated in the circuitry of the DVS-V to protect the unit against possible electrical malfunction.

Should replacement ever be required, order an 3 AG 3/4 amp. Fuse (1,25 inches long) from your distributor (Part No. 297-800).

Target Drum Installation and Synchronization

The DVS-V Screener is shipped ready for operation, with the target drum installed and synchronized with the control panel. Should the drum need to be replaced or removed, instrument owners can reinstall the drum using the following guidelines:

Drum Removal: Push the spring clips outward from the end of the drum. Slide the drum towards the rear of the instrument (away from the gears) and lift it out.

Drum Replacement and Synchronization:

1) Turn power switch on. Slowly rotate the black position gear until the motor gear stops moving. Observe which signal light on the control panel is lit. This shows how the drum is to be installed.

2) To synchronize the target drum with the control, the drum must be inserted with the corresponding target facing the lens openings at the front.

Insert the drum downward between the spring clips. Slide it forward toward the lenses until the clips snap in toward the drum. The drum gear cogs should now be engaged with the gears on both sides.

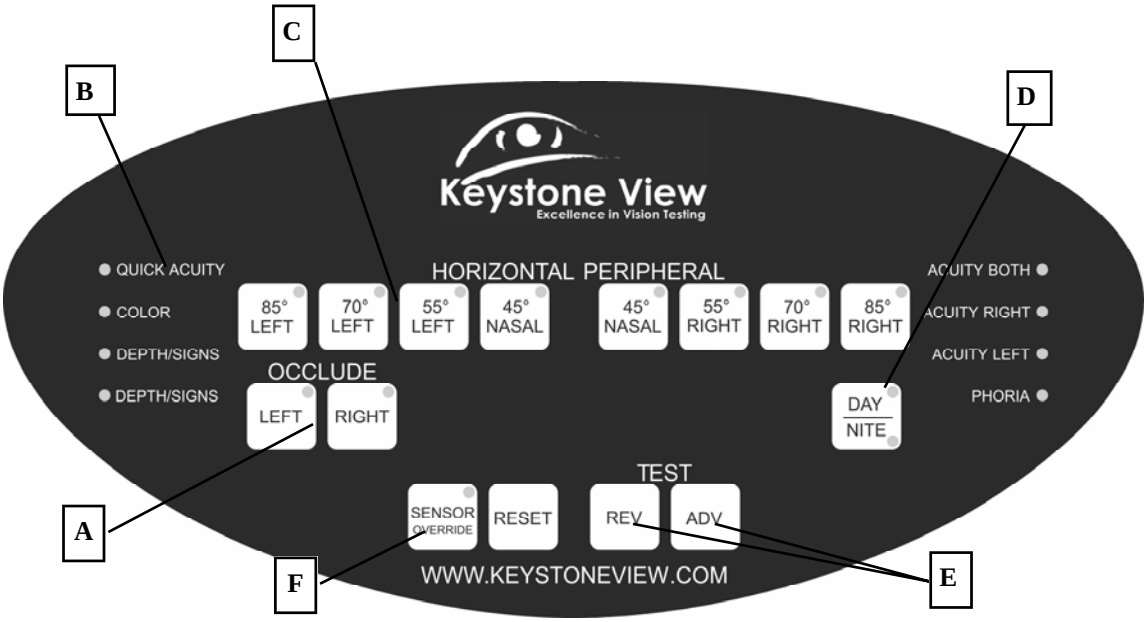
3) Press the test advance button on the control to move the drum to the next target. Look through the lenses to determine if the target is centered vertically in the lens openings.

4) If a centering adjustment is required, move only the left spring clip away from the drum and move left end of the drum backward and away from the gear. The gear must be disengaged from the drum cogs. Rotate the drum backward or forward to accomplish adjustment. Snap the drum back into position, re-engaging the gear. Recheck target alignment by looking through the lenses.

5) Repeat step 4 if necessary.

Elliptech Control Unit

The newly designed DVS-V Elliptech Soft-Touch hand control unit makes for easy operations of the vision screener. By pressing the appropriate buttons on this compact panel, the stereo tests can be advanced or reversed, the subject's eyes occluded, and the peripheral vision test lamps selectively lit. The comfortable design makes it suitable for either hand-held or desk-top operation.



A) Occlusion is controlled by pushing separate buttons for each eye.

B) Stereo tests are listed on the control key card. A lamp next to each test description signals when that target is being presented.

C) Peripheral vision target lamps are lit by pressing these buttons. A signal lamp indicates which eye and angle is being tested.

D) The day/night switch allows the examiner to toggle between simulated bright "real-life" daytime illumination and dim light nighttime illumination.

E) Touch these buttons and the stereo target drum either advances or reverses to the next test. Keep button depressed and drum will continue to rotate.

F) Head Sensor override button allows the operator the option of operating the screener without the use of the sensor. Overriding the sensor allows the operation of the machine without an examinee's head properly placed inside the headrest. Overriding the sensor is not recommended.

Test Guide

Subject to wear any glasses normally used when driving.

Test #1: Quick Acuity
Nine separate blocks containing three digits of 20/40 acuity letters each. The first column tests both eyes, the second tests right eye acuity, and the third test left eye acuity. All three lines should be read, and only as many as two digits in each column can be misread without failure. Note that we are testing ***both monocular and binocular vision*** in ***one*** test presentation. The acuity level presented is 20/40.

Test #2: Color Vision
This is a test for gross, red/green color deficiency. If at least 3 of the 4 numbers presented are not identified by the subject, further examination by a vision professional should be recommended. The key on the control shows the correct numbers to be read back by the examinee.

Test #3 & #4: Depth Perception / Sign Recognition
Twelve road signs are presented on these two tests. Signs are to be identified (eleven out of twelve) as to their meaning. Also, on each of the two presentations, one sign appears closer, one farther away from the examinee. Both the closest and the farthest signs should be identified if the individual has normal "depth" perception. The key on the control shows this information.

Test #5, 6, and 7: Acuity
These are separate tests of acuity for both eyes, right eye and left eye respectively. The acuity level of any particular block of digits is read from the key card as the denominator of the acuity ratio. For example, refer to both eyes acuity on the key card on the control to line 1 Column B and read 25=674235. This means for 20/25 acuity the response 674235 must be read. "20" refers to 20/20 acuity, "30" refers 20/30 acuity, etc.

Only one digit in each block can be missed without failure, except at the 20/100 and 20/200 levels where all digits must be read.

Test #8: Binocular Coordination (Phoria)
This simple test determines if one's eye muscles are properly balanced and coordinated. A passing response to the question, "Is the dot inside or outside the box?", will be, "inside the box." It is completely normal for the dot to move around a bit, but it's movement will slow down to a limited range in a few moments.

Test Questions and Referral Guide

Notes: All tests are given with both eyes open at all times. Subject to wear any glasses normally used for driving.

Test #1 Quick Acuity at 20/40 Level

Actual Test

QUICK ACUITY TEST

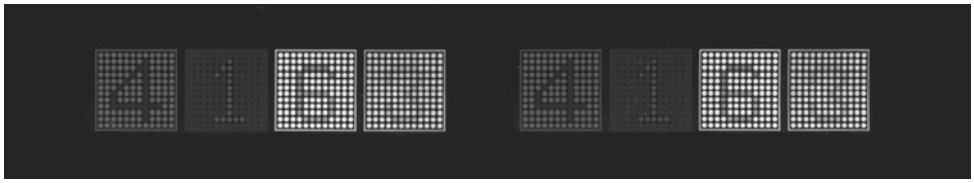
	BOTH	RIGHT	LEFT
1.	958	479	823
2.	347	563	268
3.	426	728	534

Ask your subject: " Do you see three columns with numbers?" "Look at the first column, starting from top to bottom, please read the digits to me." "Now the second column, an the third column, please?"

Referral: If more than two digits in any column are missed

Test #2 Color Deficiency

Actual Test



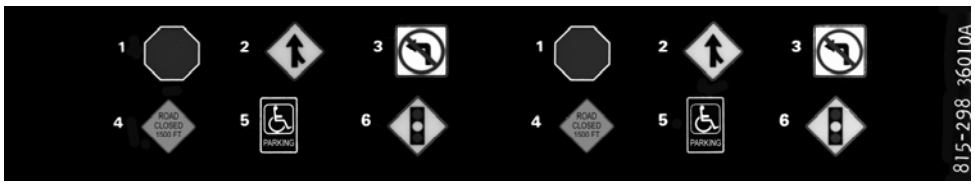
COLOR
4163

Ask your subject: " Do you see four blocks with multi-colored dots?" "Can you distinguish numbers within the blocks?" "Please read them."

Referral: If at least two numbers are misread.

Test #3 & #4 Depth Perception & Sign Recognition

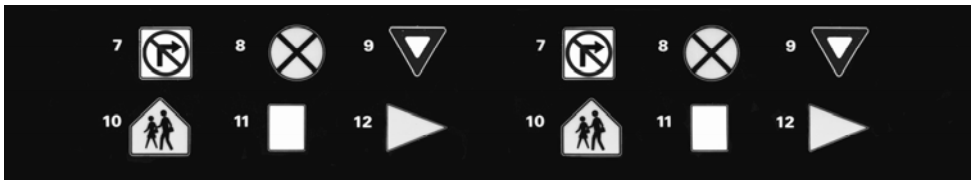
Actual Test



DEPTH / SIGNS	
1. STOP (NEAR)	4. ROAD CLOSED
2. MERGE	5. HANDICAPPED (FAR)
3. NO LEFT TURN	6. SIGNAL AHEAD

Ask the subject: "Please identify all six road signs. What do they mean?" "Do any appear closer to you than the others?" "Which one?" "Do any appear further away from you?" "Which?"

Actual Test



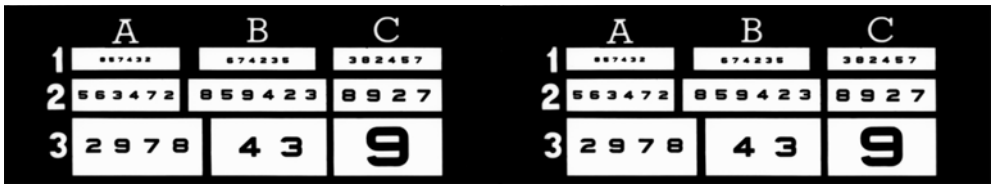
DEPTH / SIGNS	
7. NO RIGHT TURN	10. SCHOOL (FAR)
8. RAILROAD (NEAR)	11. REGULATORY
9. YIELD	12. NO PASSING

Ask the subject: "Please identify all six road signs. What do they mean?" "Do any appear closer to you than the others?" "Which ones?" "Do any appear further away from you?" "Which?"

To pass subject should identify 11 out of 12 road signs for meaning and all four signs which are at different depths.

Test #5 Binocular Acuity

Actual Test



	A	B	C
1.	20 = 857432	25 = 674235	30 = 382457
2.	40 = 563472	50 = 859423	60 = 8927
3.	70 = 2978	100 = 43	200 = 9

Note: Double Check the day/nite switch for desired position.

Ask your subject to read the first block of characters, Column A. If they are read correctly, he/she has 20/20 acuity, and they need not read any further. Five of six characters must be read. Continue across each row, from left to right until your test subject reads the characters in a block successfully.

The above table indicates the acuity level associated with the corresponding test characters: 20/20, 20/25, 20/30, etc… For example, in Row 1, Column B, "25" indicates that the acuity level tested here is 20/25.

Test #6 Right Eye Acuity

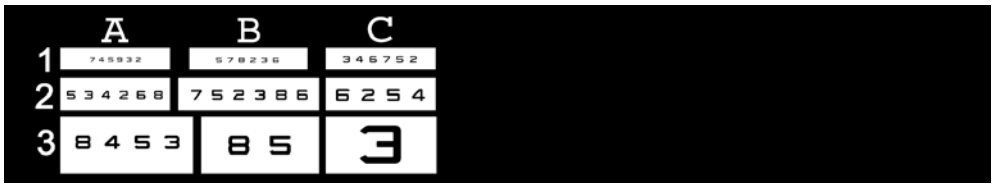
Actual Test

	A	B	C
1.	20 = 547638	25 = 428576	30 = 943852
2.	40 = 795823	50 = 357248	60 = 7236
3.	70 = 9574	100 = 92	200 = 5

Proceed in the same fashion as test #5. Be sure to instruct the subject to keep both eyes open at all times. He/she may report that no characters are seen, in which case a visual suppression is evident and should be referred for a full professional eye examination.

Test #7: Left Eye Acuity

Actual Test



	A	B	C
1.	20 = 745932	25 = 578236	30 = 346752
2.	40 = 534268	50 = 752386	60 = 6254
3.	70 = 8453	100 = 85	200 = 3

Proceed as on test #5 and #6.

To pass the acuity test, at least five of six characters must be read in Blocks A, Line 2 on each of the tests 5,6, and 7. This is a standard of 20/40 for each eye separately, and both eyes together. This standard corresponds to most State requirements. Business and industry may have more strict requirements which must be considered in establishing a pass/fail standard.

Test #8: Phoria

Actual Test

PHORIA
DOT INSIDE BOX

Ask your subject “Is the red dot inside or outside the yellow box?” If the dot is outside the box, a referral should be made.

(N.B.: Some subjects will see only the red dot or only the yellow box. This indicates they are using only one eye, either because the other is blind or “lazy” or because they have some other kind of “binocular vision problem”. In any case, unless the subject already knows he has such a defect, he/she should be referred for a full examination.)

Horizontal Field Testing

HORIZONTAL FIELD

LEFT SIDE				RIGHT SIDE			
85°	70°	55°	NASAL	NASAL	55°	70°	85°

This test shows a subject's range of vision to each side when he/she looks straight ahead. Having the subject direct his/her attention to a far-point stereo target and then lighting the peripheral target lamps at random. The stereo target used should be a simple binocular target.

Tell the subject to continue looking at the numbered circles of the color vision target. Explain that at any time a light may flash to the left or right side of the target. When it does, the subject is to indicate "left side", "right side", or "both sides."

All peripheral target lamps should be lit, but the order of their appearance is left to the examiner. Checking the appropriate box on the form for each target identified.

Subjects should be able to respond to at least the 55° and 70° temporal tests for each eye. If they cannot, a visual problem may exist and referral should be made.

2200 Dickerson Road, Reno NV 89503
Phone: (775) 324-2799 (800) 806-6569
Fax: (775) 324-5375
Email: saIes@keystoneview.com